

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MASANOBU IWASAKI
and
YOSHIO HAYASHIDE

Appeal 2007-0236
Application 09/934,474
Technology Center 3700

Decided: March 27, 2007

Before BRADLEY R. GARRIS, CATHERINE Q. TIMM, and LINDA M. GAUDETTE, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal which involves claims 1-19. We have jurisdiction under 35 U.S.C. §§ 6 and 134.

We AFFIRM-IN-PART.

The Appellants invented an apparatus and method for polishing a semiconductor substrate with a polishing solution which comprises an abrasive slurry, an additive, and pure water. According to the Appellants' disclosure, when these ingredients are mixed together prior to use, abrasive grains coagulate thereby forming undesirable coarse grains which cause unacceptable scratch of the semiconductor substrate (Specification 3-4). The invention avoids this problem by separately spraying each of these ingredients as a mist (Specification 4-5). In one embodiment, these ingredients are sprayed as a mist into a mixing unit to form a polishing mixture and the mixing unit supplies the polishing mixture onto the polishing table (Fig. 8). In another embodiment, the ingredients are sprayed as a mist onto the polishing table so they mix together on the table (Fig. 7). These embodiments are represented by independent claims 1 and 2 respectively, which read as follows:

1. An apparatus including a polishing solution supply system, the polishing solution supply system comprising:

a polishing table for placing a semiconductor substrate on a major surface thereof;

a first supply unit for spraying and supplying a mist comprising abrasive slurry;

a second supply unit for spraying and supplying a mist comprising additive;

a third supply unit for spraying and supplying a mist comprising pure water; and

a mixing unit for mixing the mist of abrasive slurry supplied from said first supply unit, the mist of additive supplied from said second supply unit

and the mist of pure water supplied from said supply unit third supply unit [sic] to form a polishing mixture, said mixing unit supplying the polishing mixture onto said major surface of said polishing table.

2. An apparatus including a polishing solution supply system, the polishing solution supply system comprising:

a polishing table for placing a semiconductor substrate on a major surface thereof;

a first supply unit for spraying and supplying a mist comprising abrasive slurry to a specified location on said major surface of said polishing table;

a second supply unit for spraying and supplying a mist comprising additive onto said major surface of said polishing table so as to mix with the mist of abrasive slurry supplied from said first supply unit; and

a third supply unit for spraying and supplying a mist comprising pure water onto said major surface of said polishing table so as to mix with the mist of abrasive slurry supplied from said first supply unit and with the mist of additive supplied from said second supply unit.

The references set forth below are relied upon by the Examiner as evidence of obviousness:

Murphy	US 5,478,435	Dec. 26, 1995
Chamberlin	US 5,997,392	Dec. 7, 1999

Claims 1-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Murphy in view of Chamberlin.¹

¹ The Appellants have separately grouped the appealed claims in the manner indicated on page 4 of the Brief whereby the apparatus and method claims representing the Figure 8 embodiment are grouped and argued separately

OPINION

We will sustain the rejection of claims 2, 4, 7, 9, 11, 15, 17, and 19 which are directed to the Figure 7 embodiment. However, we will not sustain the rejection of claims 1, 3, 5, 6, 8, 10, 12-14, 16, and 18 which are directed to the Figure 8 embodiment.

Murphy discloses an apparatus and method for polishing semiconductor wafers with a polishing solution comprising the here claimed ingredients wherein the ingredients are separately dispensed onto the polishing pad where they are mixed together at the point of use (col. 2, ll. 17-46). Murphy teaches a number of advantages such as improved control as a result of separately supplying the ingredients and mixing them at (or just prior to) the point of use (col. 2, ll. 38-46; col. 6, ll. 4-26). Although these ingredients are separately dispensed onto the polishing pad, there is no teaching that the dispensing is in the form of a sprayed mist as required by independent claim 2 (and the other independent claims on appeal).

Chamberlin teaches an apparatus and method for polishing semiconductor wafers wherein the polishing solution is sprayed as a mist onto the polishing pad (Abstract; col. 5, ll. 49-51). Chamberlin teaches that his spraying technique results in several advantages such as effective polishing with a smaller volume of solution and improved surface uniformity (col. 6, ll. 12-23).

According to the Examiner, it would have been obvious for one with ordinary skill in this art to separately dispense Murphy's polishing solution

from the apparatus and method claims representing the Figure 7 embodiment.

ingredients onto the polishing pad in the form of a sprayed mist in order to obtain the advantages taught by Chamberlin. We agree.

The Appellants argue there is no teaching or suggestion of separately spraying as a mist each of the ingredients onto a polishing table. According to the Appellants, "[i]f one having ordinary skill in the art would have been motivated to modify the teachings of Murphy ..., the entire slurry composition would be sprayed on the surface of the polishing table" (Reply Br. 3; emphasis deleted). We do not share the Appellants' view.

The test for obviousness is what the combined teachings of the applied references would have suggested to those of ordinary skill in the art. *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). Here, the combined teachings of Murphy and Chamberlin include their respective techniques for achieving their respective advantages. An artisan would have combined these respective techniques in the Examiner's proposed manner as discussed above in order to obtain the cumulative benefits of the respective advantages associated with these techniques.

In further support of their nonobviousness position, the Appellants point out that neither Murphy nor Chamberlin contains any recognition of the problem disclosed on pages 3-4 of their Specification and solved by their invention. It is well established, however, that a motivation to combine reference teachings need not be for obtaining the same advantages taught by an applicant. *In re Kemps*, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996).

In light of the foregoing, we affirm the Examiner's § 103 rejection based on Murphy in view of Chamberlin of claims 2, 4, 7, 9, 11, 15, 17, and 19 which are directed to Appellants' Figure 7 embodiment.

Regarding independent claim 1 and the other claims directed to the Figure 8 embodiment, the Examiner points to column 5, lines 51-61, of Murphy wherein patentee teaches an embodiment that includes dispensing ingredients into a container which is used to collect the liquids for further dispensing onto the polishing pad (Answer 4). According to the Examiner, the mixing unit limitations of the claims under review would be met by modifying this embodiment so that ingredients would be dispensed into Murphy's container in the form of a sprayed mist as taught by Chamberlin (*id.*). The Examiner's obviousness position on this matter is not well taken.

We agree with the Examiner that modifying the column 5 embodiment of Murphy in view of Chamberlin as proposed above would yield the invention of appealed claim 1. The deficiency of the Examiner's obviousness conclusion is that an artisan would have had no apparent reason to so combine these reference teachings. In this regard, we emphasize that the advantages of Chamberlin's invention relate to spraying a mist of polishing solution onto a polishing pad. These advantages would not result from spraying a mist of polishing ingredients into the container of Murphy. Therefore, in the absence of impermissible hindsight, no reason exists for combining these teachings of Murphy and Chamberlin as proposed by the Examiner.

We reverse the § 103 rejection based on Murphy in view of Chamberlin of claims 1, 3, 5, 6, 8, 10, 12-14, 16, and 18.

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The decision of the Examiner is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(iv)(effective Sept. 13, 2004).

AFFIRMED-IN-PART

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